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**UNITED STATES DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA
OAKLAND DIVISION**

GOOGLE LLC,

Plaintiff/Counterclaim Defendant,

v.

ECOFACOR, INC.,

Defendant/Counterclaim Plaintiff.

Case No. 4:21-cv-03220-HSG

**DEFENDANT ECOFACOR, INC.'S
OPPOSITION TO PLAINTIFF GOOGLE
LLC'S MOTION FOR JUDGMENT ON
THE PLEADINGS PURSUANT TO FED.
R. CIV. P. 12(c) [PATENT ELIGIBILITY]**

DEMAND FOR JURY TRIAL

Date: April 14, 2022
Time: 2:00PM
Courtroom: Courtroom 2 – 4th Floor
Judge: Hon. Haywood S. Gilliam, Jr.

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I. INTRODUCTION

Google’s motion relies on attorney argument to invalidate *seventy* patent claims, including nearly sixty dependent patent claims, across four patent families at the pleadings stage. But those very same attorney arguments were already presented—and squarely rejected—by *two different judges* deciding the same issues on related EcoFactor patents. Specifically, those judges held that largely identical patent specifications with many overlapping elements reflect unconventional “improvements in energy efficient HVAC systems” and their respective control systems. *E.g.*, Ex. A (1185 Public Init. Det.) at 423-26. Even more to the point, Judge Shaw held that those related claims are not abstract under *Alice* Step One because they demonstrate a “**significant departure and improvement** over the existing electronic thermostat control systems.” *Id.*¹ Likewise, at *Alice* Step Two, the judges correctly determined that those similar claims were inventive because they “use alleged new and **nonconventional techniques.**” *Id.*

The same logic and basic holdings apply to the related patents and claims here. As with those other asserted EcoFactor patents, Google’s arguments here fail at each level of the *Alice* two-step framework. Applying controlling law to any reasonable review of the asserted patents, it is clear that the claims are not directed to abstract ideas. Instead, they are directed to technical improvements to then-existing technology, namely those associated with electronically programmable thermostats and other HVAC controls. *Alice Corp., v. CLS Bank Int’l*, 573 U.S. 208, 217, 134 S. Ct 2347, 189 L.Ed.2d 296 (2014) (claims are patent-eligible as a matter of law if “they improve an existing technological process”). Thus, they are eligible as a matter of law. *Id.*

Google’s arguments to the contrary suffer from numerous legal and factual flaws at every level—and each one is fatal to its Motion. At *Alice* Step One, to frame the claims any which way they prefer, Google suggests different claim summaries depending on which page of their brief a reader is on, but in all cases, those summaries improperly strip down the claims beyond anything resembling their true character. This violates controlling Federal Circuit precedent. Such precedent makes clear that the “directed to” analysis must at least account for and examine each invention’s

¹ All emphasis in quoted material has been added unless otherwise noted.

1 “*claimed advance*” over the prior art. *Kononklijke KPN N.V. v. Gemalto M2M GmbH*, 942 F.3d
 2 1143, 1150 (Fed. Cir. 2019). But contrary to this controlling law, Google’s Step-One analysis
 3 never even asks this question, let alone does Google discuss the intrinsic record of the patent that
 4 addresses the question. These legal errors alone are dispositive.

5 But even setting these errors aside, Google’s Step-One analysis still fails. For instance, if
 6 we were to apply Google’s Step-One oversimplification, the claims still would not be directed to
 7 abstract subject matter. Google’s contrary assertion rests on pure attorney argument that the
 8 “generic” and “conventional” HVAC control systems in the 2007-2009 time frame used servers
 9 and network-connected, wireless communicating thermostats that: (i) can calculate and
 10 automatically cause a “pre-cool” period without user-intervention to reach a setpoint *by the set*
 11 *time*, (ii) receive outside temperatures and use specific stored computer data *to calculate a*
 12 *predicted rate of change* in inside temperatures to automatically cause a controller delay; (iii) use
 13 specific outside-temperature computer algorithms to automatically *determine manual changes* for
 14 even greater effectiveness; and (iv) receive and employ “geo-spatial” signals and other data to
 15 determine whether a user is home or away in order to automatically *cause a specific compressor*
 16 *delay or stop time*. Respectfully, calling these claimed HVAC control systems “conventional”
 17 thermostats in 2007-2009 does not pass the straight-face test. And beyond that, Google’s
 18 arguments have other defects, including falsely asserting that the claims can be achieved in a
 19 person’s mind or that the claims purely recite a result. A review of the claims or law makes clear
 20 those arguments are flawed.

21 While this Court need not consider *Alice* Step Two, Google likewise fails to meet its burden
 22 at that Step because the claims recite non-generic, non-routine, and unconventional electronic
 23 HVAC control systems. In its effort to argue otherwise, Google *isolates claim elements* and
 24 contends—without support—that each element may be performed by a conventional, generic
 25 computer and memory. But that contention runs contrary to the actual *claimed combinations and*
 26 *systems*. And, at any rate, Google’s argument runs contrary to Federal Circuit precedent, which
 27 requires considering the entire claim “as an ordered combination.” *See Alice*, 134 S. Ct. at 2355.
 28 Even worse, Google’s arguments on the elements they isolate are based on nothing more than

conclusory attorney argument. On the other hand, the patents themselves prove the opposite of what Google contends. And though the intrinsic record is enough to defeat the motion, *Google's own patents* and other facts further prove the ordered combinations were in no way “conventional.”

At minimum, the evidence shows numerous questions that plainly preclude granting Google's motion on the pleadings. Moreover, the Court has not yet construed the claims, and the parties have not conducted any discovery. Either activity will only further confirm the eligibility of the claims. Google's motion should be denied in its entirety.

II. RELEVANT LEGAL STANDARDS

To determine patent eligibility under § 101, courts conduct a two-step analysis as articulated by the Supreme Court in *Alice Corp. Pty. v. CLS Bank Int'l*, 573 U.S. 208, 216 (2014). First, the court must determine “(1) whether the claim, as a whole, is ‘directed to’ patent-ineligible matter—here, an abstract idea—and (2) if so, whether the elements of the claim, considered individually or as an ordered combination ‘transform the nature of the claim’ into a patent-eligible application.” *Ancora Techs., Inc. v. HTC Am., Inc.*, 908 F.3d 1343, 1347 (Fed. Cir. 2018).

The Federal Circuit has emphasized the importance of the first step of the § 101 analysis, explaining that *Alice* “plainly contemplates that the first step of the inquiry is a meaningful one.” *Enfish, LLC v. Microsoft Corp.*, 822 F.3d 1327, 1334 (Fed. Cir. 2016). The “directed to” inquiry requires consideration of the “in light of the specification” to determine whether “their character as a whole is directed to excluded subject matter.” *Id.* If the claims are not directed to an abstract idea, then the inquiry ends and the claims are eligible under § 101. *Ancora*, 908 F.3d at 1349.

But if the claims are directed to an abstract idea, the second step of the *Alice* analysis calls for the court to “consider the elements of each claim both individually and ‘as an ordered combination’ to determine whether [the claims contain] an element or combination of elements that is ‘sufficient to ensure that the patent in practice amounts to significantly more than a patent upon the [abstract idea] itself.’” *Alice*, 134 S. Ct. at 2355. Even where elements are conventional, the specific arrangement of conventional technologies can also form the inventive concept. *BASCOM Glob. Internet Servs., Inc. v. AT&T Mobility LLC*, 827 F.3d 1341, 1349 (Fed. Cir. 2016).

“[W]hether a claim recites patent eligible subject matter is a question of law which may

contain underlying facts.” *Berkheimer v. HP Inc.*, 881 F.3d 1360, 1368 (Fed. Cir. 2018). Moreover, dismissal under Rule 12 “is appropriate only where the complaint lacks a cognizable legal theory or sufficient facts to support a cognizable legal theory.” *Mendiondo v. Centinela Hosp. Med. Ctr.*, 521 F.3d 1097, 1104 (9th Cir. 2008). Indeed, “at the motion to dismiss stage a patent claim can be found directed towards patent ineligible subject matter if the *only* plausible reading of the patent must be that there is clear and convincing evidence of ineligibility.” *E.g., JSDQ Mesh Techs. LLC v. Fluidmesh Networks, LLC*, No. 16-CV-212-GMS, 2016 WL 4639140, at *1 (D. Del. Sept. 6, 2016) (emphasis in original).

III. GOOGLE’S MOTION FAILS AT *ALICE* STEP ONE AND STEP TWO

A. Under Controlling Precedent, the Asserted Claims Are Not Directed to Any Abstract Ideas, as a Matter of Law

1. Under Any Reasonable Interpretation, the Asserted Claims Are Directed to Technical Solutions to Technical Problems Specific to Electronic HVAC Controls

Applying the law to any reasonable reading of the patents, it is clear that the claims are not directed to abstract ideas. The specifications confirm the claimed inventions improved existing electronic thermostat and HVAC control systems in the mid-to-late 2000s by solving technical problems that were *unique to that technology area*.

The ’186 Patent

As the specification of the ’186 patent makes clear, “conventional” thermostats and other controls had “no mechanism by which it might take the thermal mass of the structure into account;”

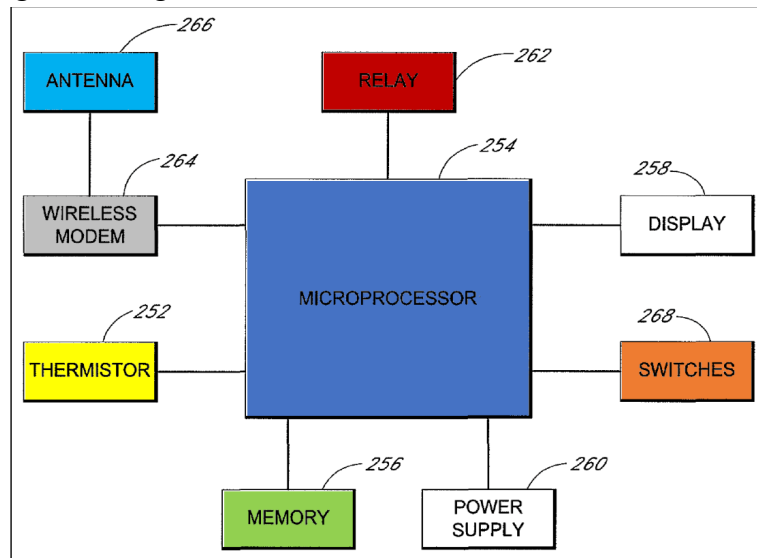
A conventional thermostat has no mechanism by which it might take the thermal mass of the structure into account, but thermal mass significantly affects many parameters relating to energy efficiency.

See, e.g., ’186 patent at 3:1-6. But as the named inventors realized, “thermal mass significantly affects many parameters relating to energy efficiency.” *Id.* And due to variations in thermal mass—and the limitations in conventional “electronic digital” programmable thermostats—the “significant theoretical savings” they may one day be able to achieve “are rarely realized.” *Id.* at

Background, 1:03-62. Understanding the thermal mass for each unique home could be a key predicate to providing optimized schedules, evaluating HVAC performance, and other features described in the patent. *Id.* And even the then-existing digital programmable thermostat and electronic HVAC controls had no way of dealing with these problems. As just one example, they had a limited number of different input signals, usually just “ambient temperature and the preset desired temperature.” *Id.*

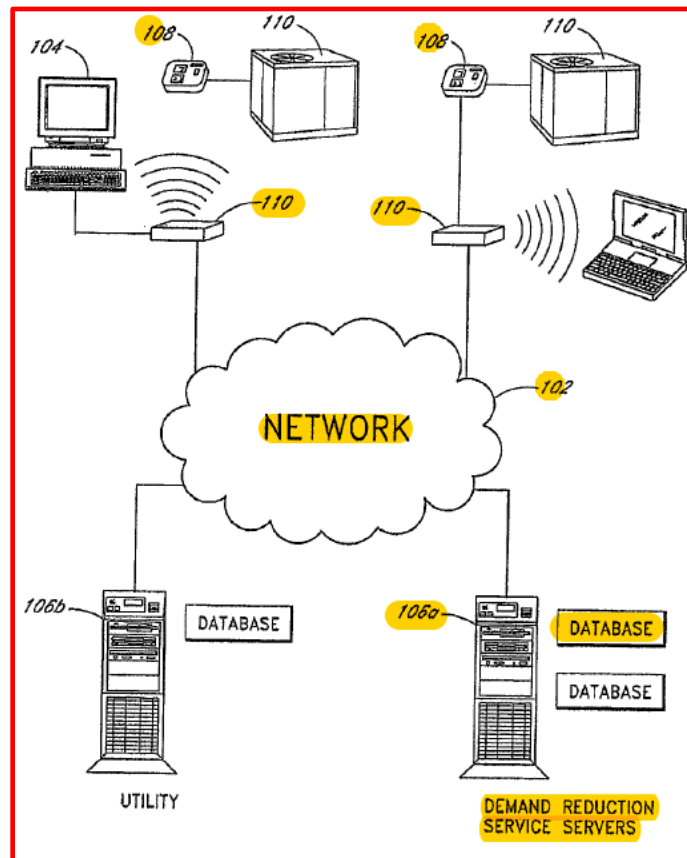
Faced with the above shortcomings, the named inventors worked to develop a solution: an electronic HVAC control system with a wireless networked, communicating thermostat system and a server configured to behave unconventionally to improve the technical shortcomings of the day. Specifically, unlike the thermostats at the time, this system uses connected computer servers to predict changes in inside temperature based on outside temperature and the status of the HVAC—to automatically direct the control system to “pre-cool” the structure and then direct the control system to reduce electricity demand during a specific period of time after the structure is within a particular temperature setting. *Id.* at 3:02-6:54; claim 1.

And with dozens of columns of patent teachings and figures, the inventors taught the world various embodiments that achieve these inventive solutions. As an exemplary figure in the patents shows, the inventors designed a new system that electronically controlled the wireless connections and antenna, along with a thermistor, memory, and an electronic relay and switches to control the output of the heating or cooling:



Id. at Fig. 4 (annotated). As one look at the above system shows, this network-connect, wireless communicating thermostatic HVAC control system is anything but “conventional.”

Using a networked, wireless communicating HVAC control system to obtain temperature in a structure and advantageously obtain outside temperature from a source *other than* the HVAC system—as well as the status of an HVAC. *Id.* at 3:02-4:54, 6:14-59, Figs. 1, 2, 4. From these different data, the system can effectively learn about its environment to account for each structure’s potentially different thermal properties—and improve the control of the HVAC and its temperature settings. *Id.* at 3:02-4:54, 7:09-67, 9:09-31. And by storing certain data and obtaining data about the inside temperature, outside temperature and operating status of the HVAC over time, the server-connected HVAC-control system can determine the predicted change of internal temperature over time, which it then uses to automatically cause a novel “pre-cool” period before then directing the HVAC control to reduce electricity demand during a high-demand period. *Id.* at 3:02-4:54. The exemplary system architecture shows just how much this system differed from conventional HVAC controls at the time.



E.g., Fig. 2. And unlike the conventional systems at the time, these claimed systems were now potentially capable of numerous advanced numerous benefits, including new and improved cost and energy reduction, while also improving the user experience by *eliminating* user interaction. *Id.* at 8:01-30. For instance:

Because the system will be able to calculate effective thermal mass, it will be able to determine the cost effectiveness of strategies such as pre-cooling for specific houses under different conditions. FIG. 9a shows a graph of outside tempera-

Any reasonable review of the actual claims of the '186 patent demonstrate this claimed advance as well. That is, even in their most basic form, the claims are directed to:

- a networked system including remote servers configured to calculate predicted rates of change of inside temperature based on the status of the HVAC and outside temperatures from a non-HVAC source—in order to automatically “pre-cool” the structure before directing the HVAC control to reduce electricity demand.

E.g., Cl. 1. Ask yourself: is that a summary of a “generic” and “conventional” thermostats or HVAC controls in 2007—or even today? The answer is “no”—this system tackles the technical problems of its day in an entirely new and unconventional manner.

While this summary of the claims leaves out the vast majority of claim elements, it includes the core ones that identify the claimed advances that give these patent claims their true character. Indeed, beyond the specification and claims, the patents’ intrinsic file history and “Notice of Allowance” *also* clearly establish this point. *See* Ex B. One would not know any of this from reading Google’s brief. And according to the entire intrinsic record, the character of these claimed inventions demonstrate that they are specific technical solutions to technical problems.

The '100 Patent

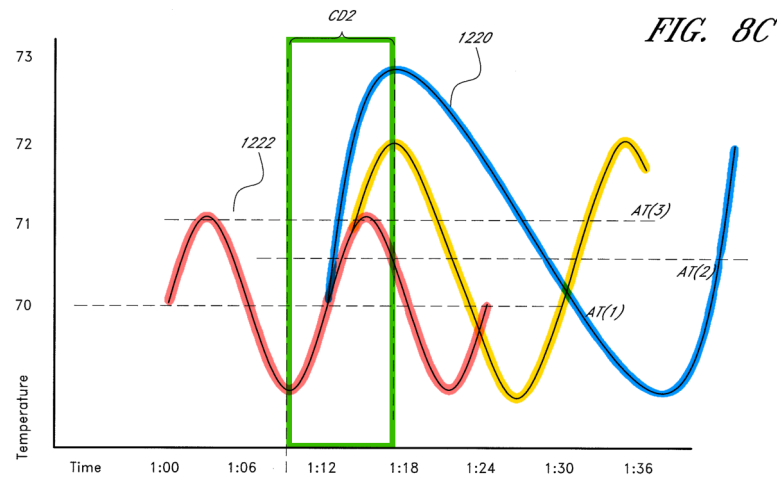
With a priority date around the same time, the **'100 patent** also recognized many of the same technical shortcomings—and includes many of the same teachings. But it tackles a few different and very specific ones as well.

In particular, the '100 patent recognizes that conventional thermostatic HVAC controls include only a single set time period for “compressor delay,” that is, the delay interval between periods in which the compressor in an HVAC system is operating. '100 patent at 2:1-3:35. But this

1 delay period can influence the energy used by the system and the wear and tear of the compressor
 2 itself. *Id.* On some days, a longer delay can conserve resources with no impact on user comfort
 3 depending on the waveforms temperatures can take over time based on various factors. Thus, “it
 4 would be “desirable for an HVAC control system to offer a simple way to create asymmetrical
 5 thermal waveforms without the need for highly detailed programming[.]” *Id.* at 3:1-35.

6 Like the other inventions, the '100 patent recognized a new and unconventional networked
 7 HVAC control system that can automatically choose between *multiple* compressor delays without
 8 the need for highly detailed programming. Fig. 1, 2, 4. By going in the unconventional direction
 9 of a networked, wireless-communicating HVAC control, the system can determine and rely on the
 10 response inside temperature has to outside temperatures over time to predict changes in inside
 11 temperature. This, in turn, would enable the system to be automatically controlled—without user
 12 intervention—to choose between more than one compressor delay interval to create more optimal
 13 improved compressor delay periods. And it can do so without sacrificing user comfort. *Id.* at 5:1-
 14 6; Fig. 7, 8A-8C.

15 For instance, using the exemplary system architecture—and with the novel use of predicted
 16 rates of change—the system can achieve its claimed inventions and the benefits that come with it.
 17 For instance, Fig. 8C shows how the same compressor delay can result in different thermal
 18 waveform cycling under different weather conditions. Col. 9:30-43. The greater the amount the
 19 outside temperature exceeds inside temperature, the more rapidly the inside temperature will
 20 increase during an off cycle, and the slower the conditioner will be able to cool during an on cycle.



1 *Id.* at Fig. 8C, 9:30-43. Thus, as compared to Figure 8B, a higher outside temperature will cause
 2 the inside temperature to increase faster, which results in wider temperature cycling. *Id.* at 9:30-
 3 43. Using the calculations employed by the system, the system can *automatically* choose to
 4 *increase the delay*, which would increase the average temperature by an amount that could reduce
 5 energy and wear, but not significantly impact user comfort. *Id.*

6 The claims expressly reflect this advance as well. Even ignoring the vast majority of claim
 7 elements, the claims make clear that, in their most basic form, the claims are directed to:

- 8 • a networked HVAC control that uses stored inside temperatures with outside
 9 temperatures to predict rates of change in inside temperatures over time, in order
 10 to determine which of multiple delay intervals to automatically select for the
 HVAC system's compressor.

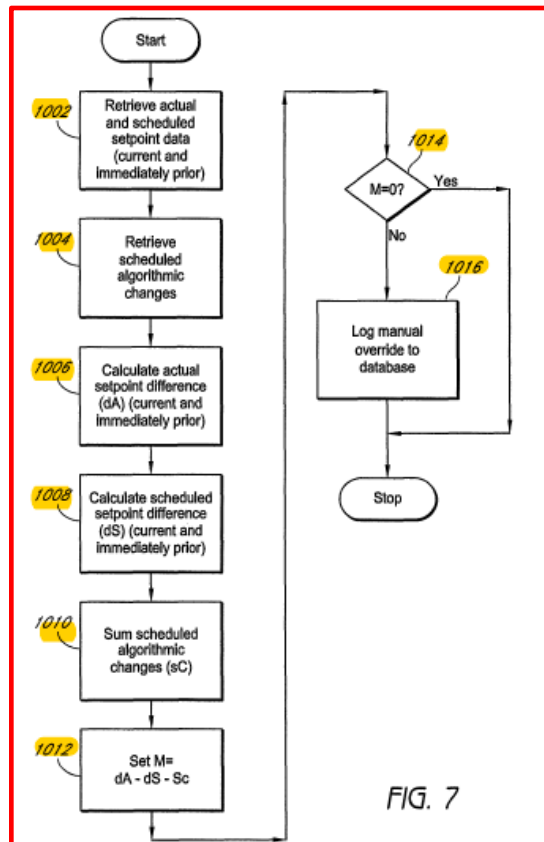
11 E.g., Cl. 1. Indeed, beyond the specification and claims, the patents' intrinsic file history and
 12 "Notice of Allowance" *also* clearly establish this point. *See* Ex C. And according to the entire
 13 intrinsic record, the character of these claimed inventions demonstrate that they are specific
 14 technical solutions to technical problems unique to HVAC control at the time.

15 The '597 Patent

16 With a priority date around the same time, the '**597 patent** also tackles a few different,
 17 additional technical shortcomings in the field of electronic HVAC controls. The inventors
 18 recognized that making manual changes to programmable electronic thermostats—which was the
 19 conventional way of using them—had major drawbacks. '597 patent at 1:18-2:18. In particular,
 20 their interface was not very user-friendly and, moreover, users would tend to overshoot the desired
 21 changes when making them. *Id.* But doing so could both make occupants uncomfortable and waste
 22 energy and money. *Id.* It would thus be advantageous for an HVAC control of adapting or learning
 23 from signaling from the occupants and incorporating those changes over time to automatically
 24 determine whether a manual change should result in a setpoint adjustment *or not*. *Id.*

25 The patent taught exemplary system architecture and algorithmic programming to do just
 26 that. In one embodiment, those algorithmic changes are learned and incorporated in the manner
 27 as depicted in Fig. 7, to enable the claimed inventions, by deriving a way to compares actual
 28

setpoints with one or more automated setpoints in order to determine whether the actual or automated setpoints are the same or different based on a difference value:



Google steers clear of showing the claims of this patent—and that might be understandable in light of the detailed nature of the invention—so EcoFactor will depict it for this Court:

17. An apparatus for detecting manual changes to one or more setpoints for a thermostatic controller, the apparatus comprising:

a programmable communicating thermostat operatively connected to a heating ventilation and air conditioning system, the temperature set point of the heating ventilation and air conditioning system being manually changeable;

at least an electronic storage medium comprising stored data of a plurality of internal temperature measurements taken within a structure and a plurality of outside temperature measurements;

computer hardware configured to communicate with the electronic storage medium and with the programmable communicating thermostat, the computer hardware configured to use the stored data to predict a rate of change of temperatures inside the structure in response to changes in outside temperatures;

the computer hardware further configured to calculate a scheduled setpoint programming of the programmable communicating thermostat for one or more times to control the heating ventilation and air conditioning system based on the predicted rate of change, the scheduled programming comprising one or more automated setpoints;

wherein the programmable communicating thermostat records actual setpoints of the heating ventilation and air condition system;

wherein the computer hardware is further configured to store in the electronic storage medium, the one or more automated setpoints associated with the scheduled programming for the programmable communicating thermostat;

wherein the programmable communicating thermostat records actual setpoints of the heating ventilation and air condition system;

wherein the computer hardware is further configured to obtain the actual setpoints from the programmable communicating thermostat and store the actual setpoints in the electronic storage medium;

wherein the computer hardware is further configured to compare the one or more automated setpoints associated with the scheduled setpoint programming with at least one of the actual setpoints; and

wherein the computer hardware is further configured to detect a manual change to the one or more automated setpoints by determining whether the at least one of the actual setpoints and the one or more automated setpoints are the same or different based on the difference value.

Even ignoring the vast majority of limitations, in their most basic form, the claims are directed to:

- a networked HVAC control that uses stored predicted rates of change in inside temperature to calculate scheduled programming comprising automated setpoints that also compares actual setpoints with one or more automated setpoints in order to determine whether the actual or automated setpoints are the same or different based on a difference value.

E.g., Id. at cl. 1 Beyond the specification and claims, the patents' intrinsic file history and "Notice of Allowance" *also* clearly establish this point. *See* Ex D. And according to the entire intrinsic record, the character of these claimed inventions demonstrate that they are specific technical solutions to technical problems unique to HVAC control at the time.

The '890 Patent

Finally, the '890 patent tackled yet another set of technical issues. It recognized difficulties with prior art systems, including that conventional thermostats "generally offer a very restrictive user interface [and are unable] to take into account more than two variables: the desired

1 temperature set by the user, and the ambient temperature sensed by the thermostat.” ’890 patent at
2 1:41-46. The patent proposes to reduce energy consumption by adding “occupancy detection
3 capability to residential HVAC systems [which] could also add considerable value in the form of
4 energy savings without significant tradeoff in terms of comfort.” *Id.* at 2:60-3:20. But prior art
5 occupancy detection systems required a motion sensor that was electrically connected to the
6 HVAC systems. *Id.* at 2:51-56 (“Recently, systems have been introduced in which a motion sensor
7 is connected to the control circuitry for the HVAC system...[w]hen the motion sensor detects
8 motion (which is assumed to coincide with the return of the guest), the HVAC system resets to the
9 guest’s chosen setting.”). The patent observed that such systems “used in hotels do not easily
10 transfer to the single-family residential context,” because a “single motion sensor in the average
11 home today would have limited value because there are likely to be many places one or more
12 people could be home and active yet invisible to the motion sensor.” *Id.* at 2:60-3:20.

13 The patent proposed to replace such prior art systems for occupancy detection with a better
14 one that would detect occupancy in a more accurate and cost effective manner. *Id.* The patent
15 further explained that it would be “desirable to provide a system that could accurately detect
16 occupancy regardless of which room in the house is occupied, and could optimize energy
17 consumption based upon dynamic and individually configurable heuristics.” *Id.* at 3:15-20.

18 And thus, the patent discloses novel inventions and in numerous described embodiments
19 to address the problems recognized by the inventors, including the use of networked consumer
20 electronics devices as indications of occupancy of a structure for purposes of automatically
21 adjusting the temperature setpoint on a thermostatic HVAC control. And it would do so not by
22 using sensors, but geospatial coordinates of connected mobile devices—which is no small feat
23 and, more to the point here, something no conventional system did at the time. Fig. 7 teaches one
24 example of an algorithmic programming used by the unconventional electronic networked system
25 architecture for achieving these benefits:
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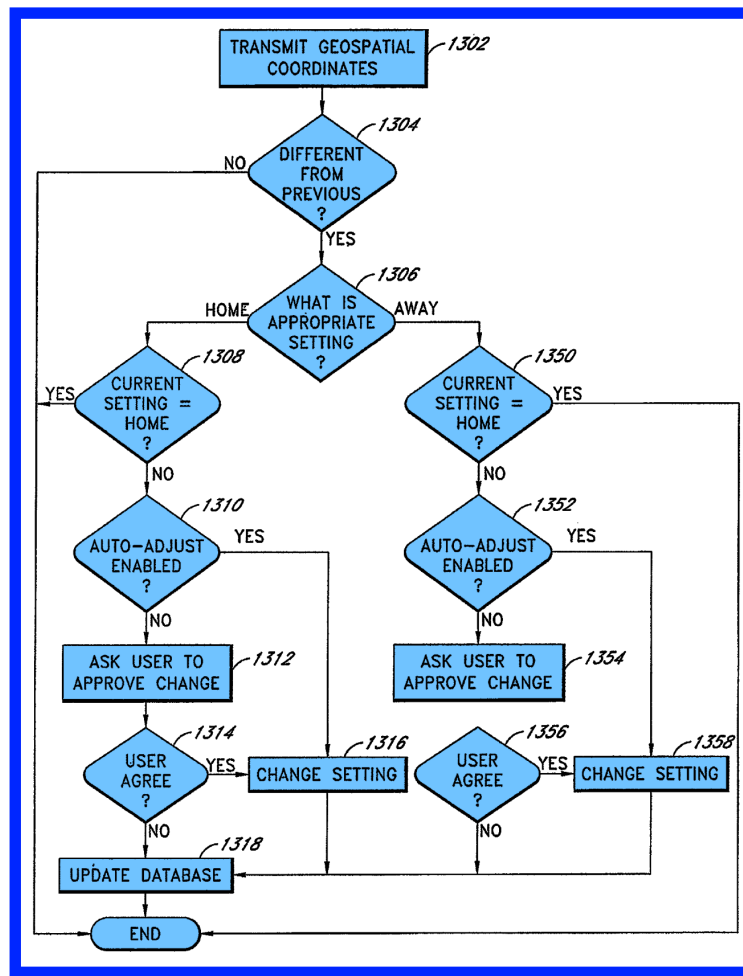


FIG. 7

Under any review of the claims of the patent, even in its most basic form, they are directed to computer-networked HVAC control systems configured to:

- use radio frequency geospatial coordinates from a mobile device and additional data from other sources to determine whether a building is occupied and automatically control heating or cooling based on the determination—and circuitry to determine usage and additional circuitry to determine compressor start or stop time.

E.g., Id. at cl. 1. Beyond the specification and claims, the patents’ intrinsic file history and “Notice of Allowance” also clearly establish this point. *See* Ex E. And according to the entire intrinsic record, the character of these claimed inventions demonstrate that they are specific technical solutions to technical problems unique to HVAC control at the time.

**2. Under Controlling Precedent, the Claims Are, as a Matter of Law,
Not Directed to Abstract Ideas Under § 101**

The claims of every asserted patent are expressly directed to technical improvements to then-existing technology, namely those associated with electronically programmable thermostats and other HVAC controls. *E.g.*, *Alice*, 573 U.S. at 217 (claims are patent-eligible as a matter of law if “they improve an existing technological process”). Moreover, as the patents so state—and as reality confirms—the claimed systems provide these improvements by going in totally unconventional directions than traditional HVAC controls. The asserted claims are thus patent-eligible as a matter of law. *Id.*

The Supreme Court’s decision in *Diamond v. Diehr* is instructive and contradicts the premises on which Google’s motion rests. In that seminal decision, the Supreme Court confirmed the patent-eligibility of a claimed method directed to using the “Arrhenius equation to calculate the optimal cure time [of rubber] using, among other variables, the internal temperature of [a rubber] mold.” *Thales Visionix, Inc. v. United States*, 850 F.3d 1343, 1347 (Fed. Cir. 2017) (citing *Diamond v. Diehr*). Per the Court, this invention was patent-eligible because it improved upon shortcomings specific to “prior art molding methods.” It did this by “constantly measur[ing] the actual temperature inside the mold, re-calculating the ideal cure time, and automatically” ending the process when the ideal cure time equaled the actual time elapsed. *Id.* And all this was true even though the claims included and made reference to a “well-known mathematical” formula calculation. *Id.* To help courts draw a distinct line between non-abstract ideas and abstract ones, the Court noted that the case before it stood in contrast to the one it decided years earlier, in *Parker v. Flook*, where claims requiring the use of a specific equation were held unpatentable because they simply used a computer to provide a better “method of calculating alarm limit values” *not specific to any particular technology*. *Parker v. Flook*, 437 U.S. 584, 594-95 (1978). In that case, the mathematical “alarm limit value” formula itself was an “abstract idea” that was not directed to solving any technical problems specific to any particular technology area. And thus, a “computer implementation was purely conventional” because “the ‘use of computers for ‘automatic monitoring-alarming’” was “well known.” *Alice*, 573 U.S. at 222 (quoting *Flook*, 437 U.S. at 594).

1 Like the patent and claims in *Diehr*—and unlike those in *Flook*—the asserted patent claims here
2 provided technical solutions to shortcomings that were specific to a particular technical field.

3 The Federal Circuit in *Thales Visionix v. United States* applied the same logic and
4 distinctions required by *Diamond v. Diehr* to reverse a lower court’s finding of patent-ineligibility.
5 In that case, the Federal Circuit looked to the full intrinsic record to determine the claimed advance
6 under Step One. *Thales*, 850 F.3d 1343, 1346-50 (Fed. Cir. 2017). Based on that review, the court
7 held that the claims were “directed to” a system for electronic measurement of the “orientation of
8 [] tracked object” based on the data obtained from using “two inertial sensors” and a processor that
9 “utilizes a mathematical equation” to calculate the object’s orientation by using the data from the
10 sensors. *Id.* This claimed solution aimed to “eliminate[] many ‘complications’ *inherent in*” the
11 particular technical field, namely, the field of determining positing and orientation of objects. *Id.*
12 Citing *Diamond v. Diehr*, the court held that the claims could not be abstract. That was because
13 they were not merely directed to using a computer to apply “mathematical equations” for
14 determining the relative position of a moving object. *Id.* Rather, they were directed to “systems ...
15 that use inertial sensors in a non-conventional manner to reduce errors” inherent to the technical
16 field measuring relative position and calculating the objects relative orientation. *Id.* Like the claims
17 in *Thales*, the asserted claims here are also not abstract. Instead, the EcoFactor patent claims are
18 directed to providing *technical* solutions to then-existing *technical* problems.

19 **B. Google’s Arguments Fail as a Matter of Law and on the Facts**

20 **1. Google’s Motion Fails at Alice Step One Because It Does Not Account**
21 **for the “Claimed Advance” Based on the Actual Claimed Elements**

22 While the above *Alice* Step-One claim summaries (e.g., in bullets above) leave out well
23 over half of the claimed words, they still capture the essence of the claimed advance of each patent.
24 Yet, for their part, Google ignores all of the claim elements that matter or distinguish the patents
25 from any others that come before (or after) them. That is error.

26 Patent eligibility under Section 101 “is a question of law, based on underlying facts.” *SAP*
27 *Am., Inc. v. InvestPic LLC*, 898 F.3d 1161, 1163 (Fed. Cir. 2018). Under controlling precedent,
28 courts analyze patent eligibility under the two-step *Alice* framework. *Alice*, 573 U.S. at 217. Under

Step One of the *Alice* inquiry, courts must ask “whether the claim, as a whole, is ‘directed to’ [] an abstract idea.” *Ancora Techs., Inc. v. HTC Am., Inc.*, 908 F.3d 1343, 1347 (Fed. Cir. 2018). As the Federal Circuit has repeatedly stated, the *Alice* formulation contemplates that “the first step of the inquiry is a meaningful one, *i.e.*, that a substantial class of claims **are not** directed to a patent-ineligible concept.” *Enfish LLC v. Microsoft Corp.*, 822 F.3d 1327, 1334-36 (Fed. Cir. 2016). Thus, for example, under this step, a patent claim is not abstract, as a matter of law, if it presents a “specific solution to [an] existing technological problem.” *Data Engine Techs., LLC v. Google, LLC*, 906 F.3d 999, 1009 (Fed. Cir. 2018).

The Federal Circuit has made clear that the “directed to” analysis must at least account for and examine each invention’s “**claimed advance**” in the art according to the record. *Ancora Techs.*, 908 F.3d at 1347-49; *see also Kononklijke KPN N.V.*, 942 F.3d at 1150 (“At step one of the *Alice* framework, we ‘look at the focus of the claimed advance over the prior art to determine if the claim’s character as a whole is directed to excluded subject matter.’”). Skipping over this analysis is legal error, as the claimed advance “allow[s] for the improvement realized by the invention.” *McRO, Inc. v. Bandai Namco Games Am. Inc.*, 837 F.3d 1299, 1313 (Fed. Cir. 2016). Moreover, this determination may be made by reviewing the intrinsic record of the patent, but other evidence also may be considered. *CardioNet, LLC v. InfoBionic, Inc.*, 955 F.3d 1358, 1373-74 (Fed. Cir. 2020) (reversing district court’s oversimplification of claims under Step One decision and finding that a holding that the claims are not abstract as a matter of law did “not require a review of the prior art or facts outside of the intrinsic record”).

Significantly, while any determination of what claims are “directed to” necessarily involves some simplification of the claimed limitations as a whole, courts “must be **careful to avoid oversimplifying the claims** by looking at them generally and failing to account for the specific requirements” of the claims. *McRO*, 837 F.3d at 1313 (internal quotation marks omitted). Doing so will lead to reversible error. *Id.* Thus, the “directed to” inquiry, “cannot simply ask whether the claims **involve** a patent-ineligible concept, because essentially every routinely patent-eligible claim involving physical products and actions **involves** a law of nature and/or natural phenomenon—after all, they take place in the physical world.” *Id.* (emphasis in original); *see also*

1 *Mayo Collaborative Servs. v. Prometheus Labs. Inc.*, 566 U.S. 66, 71 (2012) (cautioning against
 2 oversimplification and ignoring requirements because “all inventions at some level embody, use,
 3 reflect, rest upon, or apply laws of nature, natural phenomena, or abstract ideas”). Rather, the
 4 “directed to” inquiry applies a stage-one filter to claims based on whether “*their character as a*
 5 *whole is directed to excluded subject matter.*” *Enfish*, 822 F.3d at 1334-36.

6 In a strained effort to wrongly cast the claims as abstract, Google mischaracterizes what
 7 they are “directed to” by stripping them of their “claimed advance” and, in so doing, also stripping
 8 them of their character as a whole. Indeed, Google leaves out any mention of the file history or the
 9 claimed advance whatsoever. In so doing, it strips away the nature of the claims in a failed attempt
 10 to render them undistinguishable from most other electronic HVAC controls. But there is no hiding
 11 the intrinsic record, discussed in subsection (A) above, which shows the claimed advances even
 12 when you ignore most of the elements. Though Google picks out and isolate single words and
 13 phrases from the specification, without any context from even the paragraphs those words and
 14 phrases originate from, it never once acknowledges what the patent itself says it intends to improve
 15 over the prior art, let alone the entire claimed advance. But deliberately ignoring all of those core
 16 elements ignores how the claims expressly achieve their claimed advance. Google thus strips the
 17 very character of the claimed inventions and renders the patent virtually indistinguishable from
 18 any HVAC patent. That is error. After all, “essentially every routinely patent-eligible claim
 19 involving physical products and actions *involves* a law of nature and/or natural phenomenon—
 20 after all, they take place in the physical world.” *McRO*, 837 F.3d at 1313; *see also CardioNet*, 955
 21 F.3d at 1373-74 (reversing district court’s oversimplification of claims under Step One).
 22 Consequently, Google never describes the advance based on the patent’s discussion of technical
 23 problems that the claims were intended to solve, and thus fail at Step One. *CardioNet*, 955 F.3d at
 24 1373-74.

25 **2. Even Under Defendants’ Oversimplified Summaries, the Claims Are** 26 **Not Abstract**

27 Defendants’ own gross oversimplifications cannot avoid a conclusion of patent eligibility.
 28 For instance, for the ’890 patent, Google concedes that the claimed inventions (1) receive inside

1 temperature and an outside weather condition; (2) determine a first and second setpoint; (3)
2 receives radio frequency geo-spatial signals to determine occupancy; and (4) automatically adjusts
3 the temperature values in order to initiate heating or cooling when the building is unoccupied based
4 on that information, among other things. Mot. at 19. And while Google improperly calls these very
5 core claimed advances “excess verbiage and technical jargon,” it is obviously anything but that.
6 *Id.* These elements—including, for example, using “geo-positioning data” to initiate cooling or
7 heating automatically—even provide unconventional and technical solutions to technical
8 problems—and there is no hiding from this fact. Notably, the ’890 Patent itself clearly
9 distinguishes this unconventional approach from the conventional approach of relying exclusively
10 on motion sensors wired to the HVAC control. ’890 Patent at 2:40-3:50.

11 The same is true for the other patents, which require, among many other things, automated
12 HVAC control based on predicted rates of change in inside temperature in response to outside
13 temperature—all while using the unconventional networked, wireless communicating thermostat
14 architecture. Mot. at 6-17. For example, the ’186 Patent offers a specific technical solution to a
15 technical problem specific to automatically controlling HVAC systems to reduce electricity
16 demand while also keeping occupants comfortable and taking into account each home’s specific
17 thermodynamics without the need for additional sensor equipment beyond a thermostat. The ’100
18 Patent offers a specific technical solution to a technical problem specific to compressors that would
19 experience wear and tear without the patent’s automated delay interval approach. And the ’597
20 patent claims require calculating automated setpoints and comparing them to actual setpoints
21 recorded at the thermostat to determine differences signifying that the user is fighting with the
22 automatically scheduled programming—a technical problem unique to an unconventional HVAC
23 control that automate settings for the user that the user may not actually be comfortable with.

3. Contrary to Google’s False Assertions, the Claims Entail Much More Than Purely Conventional Systems

In the hopes of making their false assertions stick, Google also contends that the patents themselves say they are made up of entirely conventional items. Not so. To the contrary, the opposite is true, especially when properly viewing the claims as a whole under Step One (or Step Two). The patent specifications repeatedly demonstrate how the claimed inventions were designed to improve conventional programmable thermostats at the time of the invention. *See, e.g.*, ’597 patent at 1:03-62 (describing the limitations in conventional “electronic digital” thermostats—and that the “significant theoretical savings” they may one day be able to achieve “are rarely realized”). Indeed, even public deposition testimony from a named inventor, Mr. Hublou, supports this:

1	Q	Right. And in 2007, the control systems	15:58:06
2		and the HVAC systems, the conventional ones at the	15:58:10
3		time weren't all connected to the -- to a wireless	15:58:16
4		network or anything like that, fair?	15:58:21
5	A	Correct. It was very much an anomaly to	15:58:23
6		have any sort of internet-connected device inside of	15:58:26
7		your home or inside of a building.	15:58:30

Ex. F (Hublou Depo Tr.) at 194:1-7. At bottom, none of the claimed wireless-networked HVAC controls were conventional.

Google’s failed arguments run contrary to the intrinsic and extrinsic record. They also run contrary to Federal Circuit law because any claimed invention’s compatibility with conventional systems does not render it abstract anyway. *Uniloc USA, Inc. v. LG Elecs. USA, Inc.*, 957 F.3d 1303, 1309 (Fed. Cir. 2020). Indeed, nearly every case in which claims are held to be patent-eligible, the claims include known components, like the internet or a computer server or processor. It is just that, as with this case, the *combination* of those elements proves unconventional or else those components are *configured* to work in an unconventional way.

4. The Claims Cannot Reasonably Be Done on Pen and Paper or Through Mental Processes

Under their improperly stripped-down version of the claims, Defendants argue that the asserted claims can be done with pen and paper or in the human mind. *E.g.*, Mot. at 1, 18. That is ludicrous. Among many other things, all of the claims require automated HVAC control, *without* user intervention.

For instance, the '186 patent claims require automatically calculating and causing a “pre-cool” period as well as a reduced electricity demand period without user-intervention based on predicted rates of change in *indoor* temperatures that are calculated based on *outside* temperature measurements.

The '100 patent claims require a thermostat with different compressor delay intervals and a processor that uses a combination of a plurality of indoor and outdoor temperatures to predict a rate of change in response to outdoor temperatures, in order to automatically select one of two delay settings.

The '597 patent claims require calculating automated setpoints and comparing them to actual setpoints recorded at the thermostat to determine differences signifying that the user is fighting with the automatically scheduled programming, and using predicted rates of change in temperature in response to changes in outside temperature to calculate the automated setpoints.

The '890 patent receives and employs “geo-spatial” signals and other data to determine whether a user is home or away in order to automatically cause a specific temperature setpoint adjustment that initiates a cooling or heating cycle when the geo-positioning data indicates the building is *unoccupied*.

Indeed, **every** asserted claim requires, among many other things, sophisticated automation of HVAC control, either with “pre-cool” periods, reduced demand periods, compressor delay intervals, rate-of-change-based automated setpoints, or “geo-spatial” signals-based automated scheduling. The claims plainly cannot be done merely with “pen and paper.” Even Defendants’ stripped-down version of the claims cannot be performed mentally, as they also concede that automatic HVAC control is required, for instance. And as explained above, contrary to Google’s

1 assertions, all the patents actually teach and claim improved automated control by *eliminating any*
 2 *user intervention*.

3 Besides, this is the wrong question to ask in any event. Otherwise, if Google were right,
 4 cases like *Thales* or *Diamond v. Diehr*—which involved known parts and known mathematical
 5 equations—would have turned out the other way. Defendants are wrong, and their unreasonable
 6 analyses do not change years of controlling law proving them wrong.

7 **5. The Claims Plainly Do Not Only Recite Results and, Though Not**
 8 **Necessary or Required Under Step One, They Actually Explain How**
 9 **the System Achieves Its Desired Benefits**

10 Without any citation or support, Google also suggests that, under Step One, the claims do
 11 not explain how the claimed systems perform their analyses. As an initial matter, this entire line
 12 of reasoning is irrelevant, even if it were correct. That is because “[c]laims need not articulate the
 13 advantages of the claimed combinations to be eligible.” *Uniloc USA, Inc.*, 957 F.3d 1303. Put
 14 simply, “[s]pecifications teach. Claims claim.” *SRI Int’l v. Matsuhita Elec. Corp.*, 775 F.2d 1108,
 15 1121 n.14. (Fed. Cir. 1995). At any rate, a review of the properly construed (albeit improperly
 16 stripped-down version of the) claims under Google’s Step-One analysis shows that their line of
 17 reasoning is indeed false. The claims certainly describe how they achieve their claimed advance
 18 in sufficient detail—Google just ignores it.

19 **IV. GOOGLE ALSO CANNOT MEET ITS BURDEN UNDER ALICE STEP TWO**

20 Because Defendants fail at Step One, this Court need not consider Step Two. But Step Two
 21 also exposes Google’s legal and factual flaws, as they cannot meet that burden because the claims
 22 recite an undoubtedly unconventional electronic HVAC control system. *See Diamond v. Diehr*,
 23 450 U.S. 175, 188 (1981) (“In determining the eligibility of Defendants’ claimed process for patent
 24 protection under § 101, their claims must be considered as a whole. It is inappropriate to dissect
 25 the claims into old and new elements”).

26 To argue otherwise, Googler parses out and isolates each of the elements of the claim and
 27 argues—without support—that “*each and every limitation*” may be performed by a generic
 28 computer and memory. But that analysis runs contrary to precedent, which requires considering

the entire claim *as an ordered combination*. *Cellspin Soft, Inc. v. Fitbit, Inc.*, 927 F.3d 1306-07 (Fed. Cir. 2019) (must consider “whether the claimed elements—individually and as an ordered combination—recite an inventive concept.”). And when doing so, could there be any debate that the claimed networked wireless communicating thermostats that improve various issues in HVAC control are unconventional?

A. The Evidence Uniformly Confirms the Claims Are Inventive Under Step Two

1. The Intrinsic Record Alone Disproves Defendants’ Arguments and Demonstrates That the Claimed Inventions Were Unconventional

The patents themselves prove the opposite of what Defendants wrongly contend. For instance, the specification of the ’186 patent makes clear that “conventional” electronic thermostats and other HVAC controls had “no mechanism by which it might take the thermal mass of the structure into account, but thermal mass significantly affects many parameters relating to energy efficiency.” *See, e.g.*, ’186 patent at 3:1-4; 2:52-67. As the named inventors realized, due to variations in thermal mass—and the limitations in conventional “electronic digital” programmable thermostats—the “significant theoretical savings” they may one day be able to achieve “are rarely realized.” *Id.* at Background, 1:03-62. And the ’890 patent recognized difficulties with the prior art systems, and particularly that conventional thermostats “generally offer a very restrictive user interface [and are unable] to take into account more than two variables.” ’890 patent at 1:41-46. But prior art occupancy detection systems required a motion sensor that was electrically connected to the HVAC systems. *Id.* 2:51-56. And the patent observed that a “single motion sensor in the average home today would have limited value because there are likely to be many places one or more people could be home and active yet invisible to the motion sensor”—and went in a radically different direction *Id.* at 2:60-3:20. The same

As described above, the claimed networked HVAC control system inventions solved the shortcomings in the art by claiming an unconventional, *computer-networked* HVAC control system, with all the other specific claimed advances. Indeed, Defendants have nearly no analysis acknowledging the ordered combination of claim elements. That ordered combination of all the claim elements are inventive—and Defendants’ contradicted attorney argument does not change

any of that, let alone entitle them to summary judgment of invalidity. Defendants cannot meet their burden and their motion fails.

2. Google's Own Patents Also Undercut Its Motion; Indeed, They Further Demonstrate the Claimed Systems Were Not "Conventional"

Google's arguments here are further belied by the contrary statements Google has made to the Patent Office during prosecution of its own *later-filed* patents in this field. In those patents, Google acknowledged *the same technical problems EcoFactor did years earlier*—and made clear that the systems EcoFactor taught and patented years before were anything but conventional.

For instance, Google had to cite the '186 patent as prior art in *over two dozen* of its later-filed patent applications. In one such application filed years after the '186 patent, Google acknowledged during prosecution of this later filed patent that with "***conventional thermostat systems***, the thermostat will maintain the home's ambient temperature at roughly the first setpoint temperature until the second setpoint time is reached." Ex. G (U.S. Patent No. 8,630,742) at 20:35-58. And by contrast, automatically determining a pre-cool period was a different and advantageous concept when compared to conventional systems—as "a preconditioning heating or cooling operation is performed during the interval of time before the second setpoint time so that the ambient temperature ***reaches substantially the second setpoint temperature by the second setpoint time***. In this manner, the home's temperature may be near the desired temperature at the desired time." *Id.*

Likewise, in a Google application filed years after the '100 patent. Google expressly stated that existing HVAC controls had "predetermined" system behavior—and that a "more difficult control problem involves design and implementation of controllers that can produce desired system operational behaviors that are specified following controller design and implementation." And just like EcoFactor's inventors exclaimed years earlier, Google only later recognized that the ***prior control systems may depend heavily on user feedback, and such user feedback could be energy-inefficient***. Ex. H (U.S. Patent No. 9,459,018) ("For example, many users may select temperature setpoints for an HVAC system based primarily on comfort, rather than energy-

1 efficiency. Yet such energy-inefficient feedback could cause a control system to inefficiently
2 control the HVAC system.”).

3 And then there is Google’s US20130173064A1 application. Filed many years after
4 EcoFactor’s patents, it describes a self-triggered “*auto-away*” mode, which, unlike wireless
5 thermostats at that later time, “has been found to provide for more complete and more statistically
6 precise ‘tuning’ of the setpoint temperature schedule when compared to tuning that is based only
7 on the ‘conventional’ auto-away”, which can be based on sensors. Ex. I (U.S. Patent Pub. No.
8 2013/0173064) at paras. 163-64. These examples only further demonstrate the subject matter
9 eligibility of the asserted patents.

10 **3. Even at This Early Stage, Extrinsic Evidence Further Dooms** 11 **Defendants’ Meritless Arguments**

12 Though the intrinsic record alone is enough to demonstrate that the claimed electronic
13 HVAC controls were not “conventional” and, thus, defeat Google’s Motion, EcoFactor’s extrinsic
14 evidence only further reinforces the point. As contemporaneous EcoFactor-related studies make
15 clear, EcoFactor’s patented solution was able to better deal with the unique thermal problems of
16 different building structures. It did so by *unconventionally* using the HVAC control as a networked
17 sensor and collecting specific information from numerous sources, including those external to the
18 HVAC system, to make various claimed determinations that make the systems operate in a highly
19 improved manner. For his part, one of the named inventors, Mr. Hublou, confirmed the same in
20 his deposition. Ex. F (Hublou Depo Tr.) at 195:2-11.

21 **B. Though Google Cannot Meet Its Heavy Burden of Showing That Any Claim,** 22 **Let Alone All Seventy Claims, Are Ineligible, There Are at Least Significant** 23 **Questions of Fact That Preclude Google’s Motion on the Pleadings**

24 As discussed in detail above, the intrinsic records of the asserted patents themselves
25 demonstrate that they are inventive and directed to unconventional technological solutions to
26 technological problems. At minimum, these facts—which must be accepted as true and contradict
27 Google’s unsupported assertions that the claims are conventional—raise factual disputes
28 precluding dismissal at the pleading stage. *See Aatrix Software, Inc. v. Green Shades Software,*

1 *Inc.*, 882 F.3d 1121, 1126-28 (Fed. Cir. 2018). Moreover, as there are seventy patent claims
 2 involved here, if this Court has any reservations about the scope of the claims, it deserves a full
 3 claim construction record to utilize when deciding those issues. *MyMail, Ltd. v. ooVoo, LLC*, 934
 4 F.3d 1373, 1380 (Fed. Cir. 2019) (“Nevertheless, the district court's failure to address the parties’
 5 claim construction dispute is error under *Aatrix Software.*, 882 F.3d at 1125.”) These provide
 6 additional reasons for denying Google’s motion.²

7 **V. CONCLUSION**

8 For the reasons above, Google’s motion should be denied in its entirety.

9
 10 DATED: January 12, 2022

Respectfully submitted,

11 **RUSS AUGUST & KABAT**

12
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 26
 27
 28 ² And if the Court is inclined to grant any portion of Google’s motion, Federal Circuit law makes
 clear that it should do so without prejudice and give the patent owner a chance to amend its
 pleadings. *See, e.g., Aatrix*, 882 F.3d at 1126.

CERTIFICATE OF SERVICE

I certify that this document is being served upon counsel of record for Defendant on January 12, 2022 via electronic service.

/s/ Reza Mirzaie

RUSS, AUGUST & KABAT